

# RIDGE

## ENERGY STORAGE & GRID SERVICES L.P.

### **Impact of CAES on Wind in TX, OK, NM**

*DOE Energy Storage Program Peer Review Presentation*

*November 11, 2004*

# About The Study

- ◆ Proposal submitted through DOE SEP Special Projects program
- ◆ Builds off previous work performed by Ridge Energy Storage
  - West Texas wind/CAES/transmission study
    - CAES showed to relieve congestion and wind curtailments in transmission constrained area
  - Follow on study for CAES and wind in McCamey area
    - CAES showed to have cost effective impact when considering values of curtailment relief, wind shaping, and capacity value
    - Results presented at EESAT 2003

## ◆ Financial Acknowledgement

This study is being performed in accordance with the Comptroller of Public Accounts, State Energy Conservation Office, Renewable Energy Demonstration Program prepared in accordance with the Oil Overcharge Restitutionary Act, Chapter 2305, Texas Government Code and the State of Texas Oil Overcharge Funds Disbursement Plan. This study is funded in part with Exxon Oil Overcharge Settlement funds and/or by Federal Funds received from the United States Department of Energy.

# Study Objectives

## ◆ Objectives

- Assess the ability of energy storage to positively affect dispatch of renewable resources.
- Assess and quantify economic benefits of using energy storage to improve grid stability issues and congestion associated with renewable energy.
- Determine the economic advantage of using storage to firm and shape renewable energy sales.
- Determine institutional barriers and opportunities for energy storage combined with renewable energy facilities.

## ◆ Specific target area

- Energy storage technology – CAES
- Renewable energy technology – wind
- Location – Panhandle areas of Texas and Oklahoma, eastern plains of New Mexico

# Team

- ◆ Industry
  - Ridge Energy Storage & Grid Services
  - **Southwestern Public Service (Xcel Energy)**
  - RnR Engineering
  
- ◆ Academia
  - **Alternative Energy Institute**
  - **Oklahoma Wind Power Initiative**
  
- ◆ State Energy Offices
  - Texas
  - **New Mexico**
  - **Oklahoma**

*Cost share partners marked in bold print*

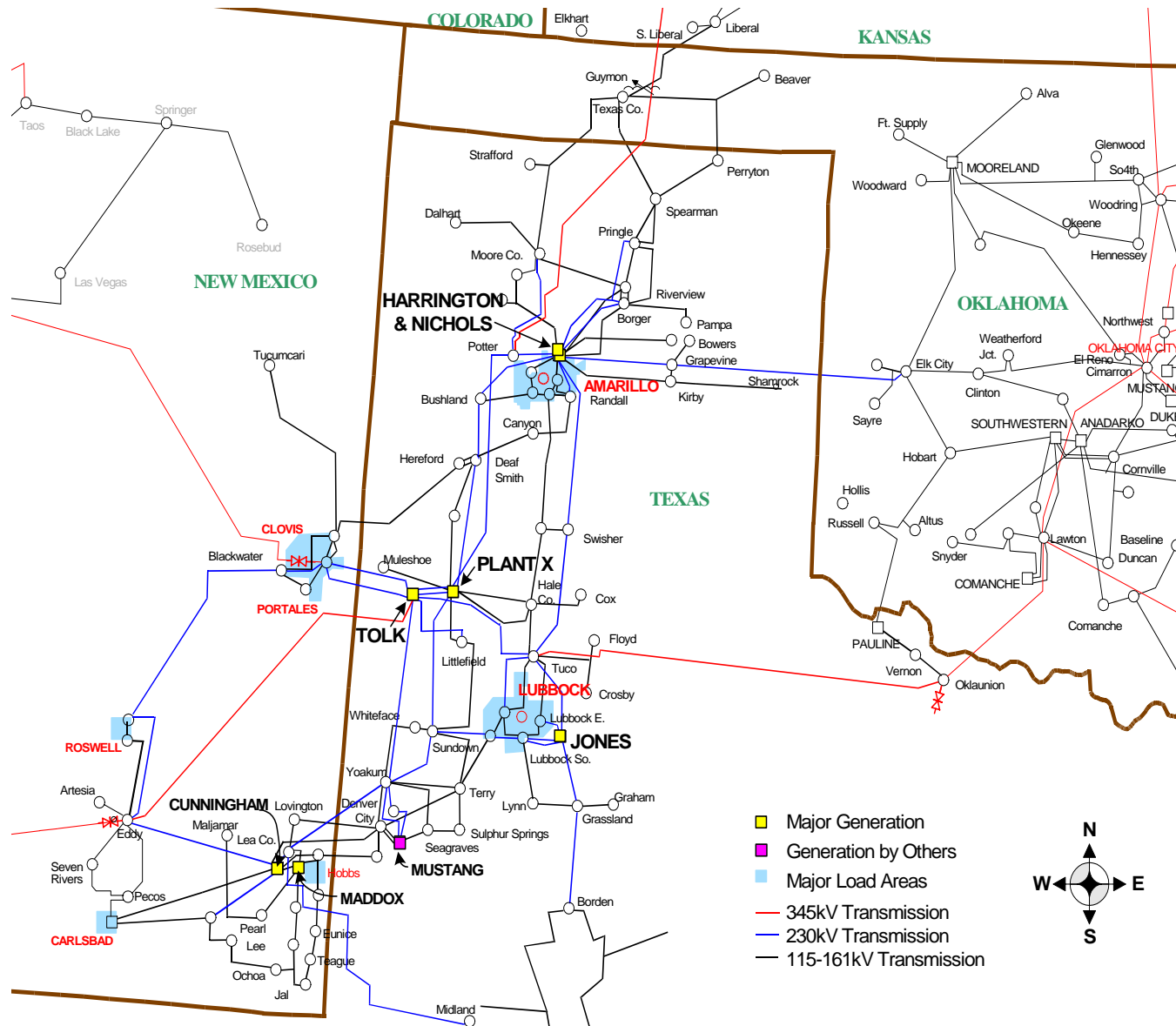
# Approach

- ◆ Develop scenario (not forecast) of wind development
  - Develop assumptions of new wind development, location and profile
- ◆ Base-case wind impact assessment
  - Analyze impact of wind on grid congestion and stability (load flow studies)
  - Determine value of wind energy in the power market
- ◆ Storage comparison
  - Analyze the impacts of wind on the transmission grid and its value in the energy markets with the inclusion of energy storage as a dispatch management tool.
- ◆ Institutional barriers and opportunities for energy storage
  - Examine regulations and power market structure to determine barriers and opportunities for energy storage

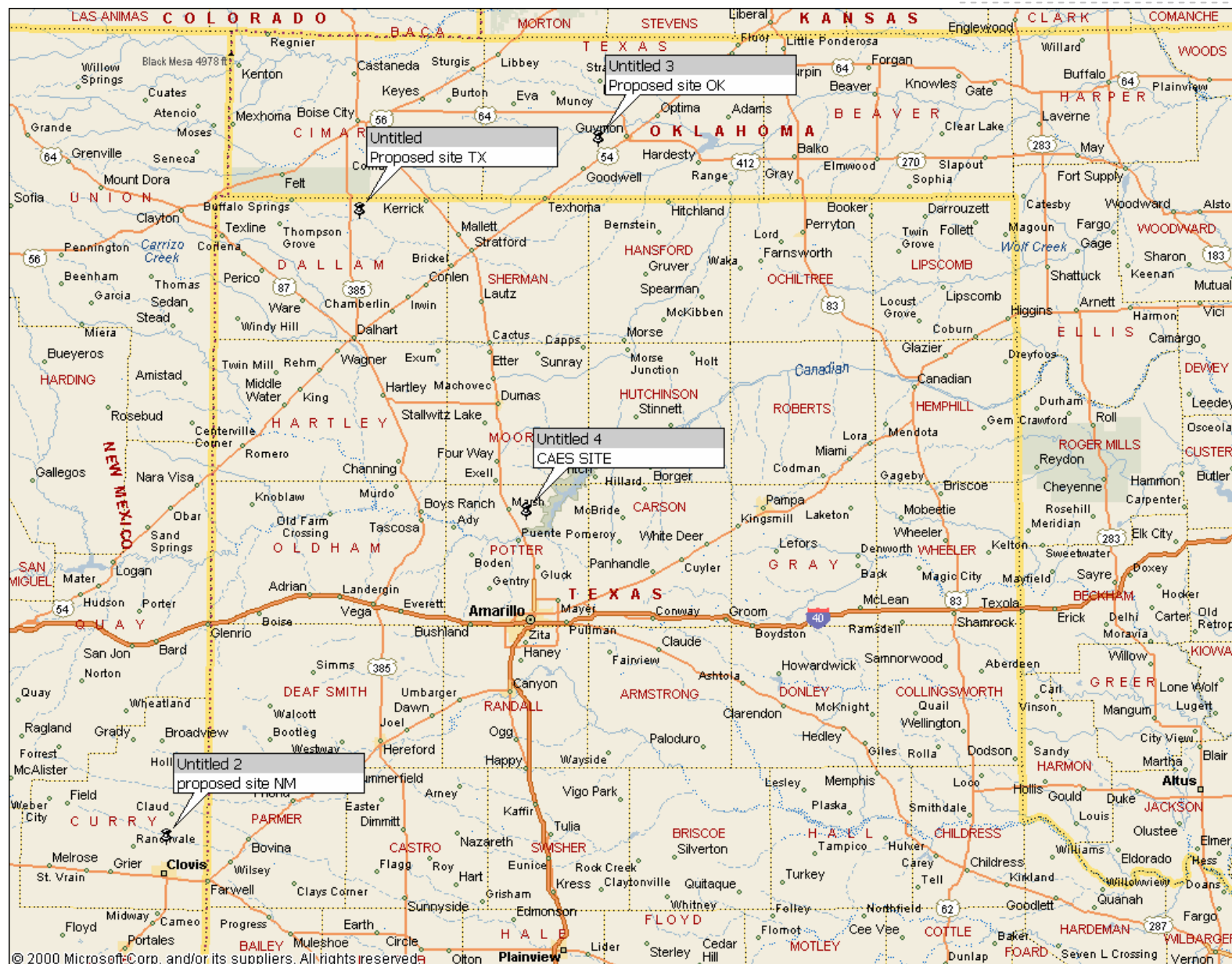
# *Wind Scenario*

- ◆ Existing/Planned Wind
  - White Deer – 80 MW
  - Caprock Wind Ranch – 80 MW
  - San Juan Mesa – 120 MW
  - Wildorado – 160 MW
  
- ◆ 500 MW of new wind
  - Guymon, OK – 166 MW
  - North Panhandle, TX – 167 MW
  - South of Tucumcari, NM – 166 MW
  
- ◆ Wind data for all sites being collected/estimated
  - Analysis includes development of profiles and correlations

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# Preliminary Modeling Locations



# Summary

- ◆ Study of CAES and wind for TX, NM, OK underway
- ◆ Conclusions expected by early 2005
- ◆ Public comment on scenarios and study methodology welcomed
- ◆ Please email [ndesai@theridgegroup.com](mailto:ndesai@theridgegroup.com) to be added to a list to stay apprised of progress on study